OLYMPUS

MAINTENANCE MANUAL

CV-160

INTRODUCTION

Repair and maintenance of this product requires highly specialized knowledge and techniques. We recommend that you contact an Olympus service center in your area if a problem develops with the product. If repairs or modifications are made by personnel not authorized by Olympus, the warranty is void, and Olympus shall not be liable for damage that occurs to or as a result of use of the modified product.

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SPECIFICATIONS

Specifications

Item		Specification
1 System specifications	1. Applicable scope	1. EVIS100 series scope 2. EVIS130 series scope 3. EVIS140 series scope 4. V series scope 5. EVIS EXERA 160 series scope 6. EVIS EXERA 145 series scope 7. Ultrasonic endoscope(100 series) Note) Applicable scope cable is MAJ-843 only.
	2. Applicable video converter	1. OES video converter OVC-100 OVC-140 Connectable with OES fiberscopes.
	3. Applicable light source unit	1. EVIS universal light source unit CLV-U40
		2. High intensity light source CLV-E, CLE-E
		3. EVIS EXERA high intensity light source unit CLV-160, CLE-145
	4. Applicable monitor	1. Recommended monitor (1) 14" observation monitor OEV141/142/143 (2) 20" observation monitor OEV201/202/203
	5. Applicable keyboard	1. CV-160 exclusive keyboard (MAJ-845)
		2. Structure (1) ASCII key layout (2) Provided with keyboard drip-proof cover (removable). (3) Mountable on WM-60 series keyboard tray. (4) Removable from CV-160. (5) Flat keys and stroke keys are mixed.
2. Television system	1. Color system	1. Signal system (1) NTSC Primary supply voltage 100V class (North America, Asia specification 1) (2) PAL Primary supply voltage 200V class (Asia specification 2) Primary supply voltage 200V class (Europe specification)
	2. Monitor standard color temperature	1. Color temperature setting (1) 6500K
	3. Synchronizing method	Synchronizing only with the SYNC signal in CV-160.
3. Input/output conditions	1. Video output signal	1. Signal system (1) VBS composite (2) Y/C (3) RGBS * Simultaneous output of (1), (2) and (3) is possible.
	2. Light control output signal	1. Output connector ・All specifications: Front scope cable connector and rear light control connector

<table>
<tr><th colspan="2">Item</th><th>Specification</th></tr>
<tr><td rowspan="2">3. Input/output conditions</td><td>2. Light control output signal</td><td>2. Output signal level
The output signal level for the automatic light control of an applicable light source is defined by the following input standard.

<table>
<tr><td colspan="2">Input signal [mV]</td></tr>
<tr><td>F</td><td>30 or more</td></tr>
<tr><td>1</td><td>15</td></tr>
<tr><td>2</td><td>12.6</td></tr>
<tr><td>3</td><td>10.8</td></tr>
<tr><td>4</td><td>9.1</td></tr>
<tr><td>5</td><td>7.5</td></tr>
<tr><td>6</td><td>6.3</td></tr>
<tr><td>7</td><td>5.4</td></tr>
<tr><td>8</td><td>4.5</td></tr>
<tr><td>9</td><td>3.8</td></tr>
<tr><td>10</td><td>3.2</td></tr>
<tr><td>11</td><td>2.7</td></tr>
<tr><td>12</td><td>2.3</td></tr>
<tr><td>13</td><td>1.9</td></tr>
<tr><td>14</td><td>1.6</td></tr>
<tr><td>15</td><td>1.4</td></tr>
<tr><td>16</td><td>1.2</td></tr>
<tr><td>17</td><td>0.95</td></tr>
</table>
</td></tr>
<tr><td>3. Power supply</td><td>1. Type
(1) 100V class: North America (OAI), Asia 1 (OLA)
(2) 200V class: Europe (OE), Asia 2 (OLA)</td></tr>
<tr><td></td><td>2. Rated voltage and input current
(1) 100V class: 100 to 120V, 1.0A
(2) 200V class: 220 to 240V, 0.5A</td></tr>
<tr><td></td><td>3. Voltage fluctuation
・ The unit performance shall be guaranteed within ±10% of the rating.
・ The unit operation shall be guaranteed within ±15% of the rating and the temperature increase in ordinary operation of IEC.</td></tr>
<tr><td></td><td>4. Frequency
・ 50/60Hz</td></tr>
<tr><td></td><td>5. Frequency fluctuation
・ The unit performance shall be guaranteed with ±1Hz of the rating.</td></tr>
<tr><td></td><td>6. Power consumption
・ 240VA</td></tr>
<tr><td></td><td>7. Power cable
(1) 100V class (3 ±0.05m cord set)
3-pin hospital grade plug
(2) 200V class (3.2m cord set)
3-pin plug-less with uneven end
(Attach an appropriate plug in the destination.)</td></tr>
</table>

<table>
<tr><th colspan="3">Item</th><th>Specification</th></tr>
<tr><td rowspan="2">4. Observation</td><td>1. Observation image display position</td><td>1. Type of observation image</td><td>The user can select the endoscopic image display size from the followings depending on the scope (CCD) applied.
<table>
<tr><td></td><td colspan="3">North America specification (NTSC)</td><td colspan="3">Europe specification (PAL)</td></tr>
<tr><td>CCD</td><td>3700,01,08</td><td>3704</td><td>37071</td><td>3700,01,08</td><td>3704</td><td>37071</td></tr>
<tr><td>Display size</td><td><u>2 steps</u>
Medium
↓
Full-height</td><td><u>1 step</u>
Full-high only</td><td><u>2 steps</u>
Small
↓
Medium</td><td><u>3 steps</u>
Medium
↓
Semi full-height
↓
Full-height</td><td><u>2 steps</u>
Semi full-height
↓
Full-height</td><td><u>2 steps</u>
Small
↓
Medium</td></tr>
</table>
Note 1)
Change the display size on the keyboard or with the scope switch or RS-232C communication.

Note 2)
Standard setting is as follows.
・ 3700/01/08: NTSC = Medium
PAL = Medium
・ 3704: NTSC = Full-height
PAL = Semi full-height
・ 37071: NTSC = Small
PAL = Small</td></tr>
<tr><td>2. Front panel picture quality adjustment</td><td>1. White balance</td><td>1. Specifications
・ When replacing the scope with a different type,adjust the white balance using the supplied white cap.
・ A memory function is provided to hold the previous white balance data even if the power switch is turned off.
・ Calibrate the white balance automatically if the scope with the scope ID function (EVIS EXERA 160 series) is connected to the CV-160.
Note) It is necessary to calibrate manually again if the light source changed.

2. Setting method
・ Select the type of light source(xenon=CLV/halogen=CLE) on the system setup screen.
・ Depress the white balance switch on the front panel.(It is not necessary for scopes with the scope ID function.)

3. Switch depression detection time
・ Approx. 1 second

4. Time required by correction operation
・ Approx. 1 second</td></tr>
</table>

Item				Specification
4. Observation	2. Front panel picture quality adjustment	2. Automatic light control		1. Specification ・ Switch the peak/average iris mode depending on a subject.
				2. Standard setting: Average
				3. Setting method (1) Switch on the front panel (2) Scope switch (3) RS-232C communication Note) Assign the scope switch on the user preset screen.
		3. Edge enhancement		1. Specification A subject image is enhanced in three steps (Low/Med./High).
				2. Standard setting: Low
				3. Setting method (1) Set the edge enhancement mode (Enh.Type: Edg.) on the user preset screen. (2) Switch on the front panel (3) Scope switch (4) RS-232C communication
		4. Structure enhancement		1. Specification A subject image is enhanced in three steps (Low/Med./High).
				2. Standard setting The standard setting of each level: Low:Level1, Med.:Level3, High:Level5
				3. Setting method (1) Set the structure enhancement mode (Enh.Type: Str.) on the user preset screen. (2) Select the set value (Level 0 to 8) for each enhancement level (L/M/H) on the user preset screen. (3) Switch on the front panel (4) Scope switch (5) RS-232C communication
		5. Color tone adjustment	1. Selection of adjustment color	1. Specification Desired color can be selected. (Select from four types of R, B, C and Light off.)
				2. Standard setting Light off (not selected)
				3. Setting method Color tone selector switch on the front panel (Each time the switch is depressed, the color is changed in the order of R, B, C, Light off and R.)
			2. Red group color adjustment (when R is selected)	1. Specification Color tone of red group can be adjusted.
				2. Standard setting Center of the variable range (±0 step)
				3. Setting method (1) Adjust with the color tone adjustment switch on the front panel. (2) Adjust with RS-232C communication.
				4. Variable range ±7 steps (LED indicates step values on the front panel.)

Item				Specification
4. Observation	2. Front panel picture quality adjustment	5. Color tone adjustment	3. Blue group color adjustment (when B is selected)	1. Specification Color tone of blue group can be adjusted.
				2. Standard setting Center of the variable range (±0 step)
				3. Setting method (1) Adjust with the color tone adjustment switch on the front panel. (2) Adjust with RS-232C communication.
				4. Variable range ±7 steps (LED indicates step values on the front panel.)
			4. Color density adjustment (when C is selected)	1. Specification Color density (chroma) can be adjusted without changing the hue.
				2. Standard setting Center of the variable range (±0 step)
				3. Setting method (1) Adjust with the color tone adjustment switch on the front panel. (2) Adjust with RS-232C communication.
				4. Variable range ±7 steps (LED indicates step values on the front panel.)
		6. Reset switch		1. Specification The output image to the observation monitor is changed to the scope image, and the light control, edge/structure enhancement and color tone and contrast etc. are set on User Preset 1.
				2. Setting method Press the reset switch on the front panel. (Depress the switch more than 1 second)
	3. Other picture quality adjustment	1. AGC		1. Specifications Turn ON/OFF as needed, depending on the endoscopic image.
				2. Standard setting: ON
				3. Setting method (1) Switch with the keys (Shift + F2 key) on the keyboard. (2) Switch with the scope switch. (3) Switch with RS-232C communication. Note) Assign the scope switch on the user preset screen.
		2. γ (contrast)		1. Specifications Selectable from the three modes. Normal :Ordinary observation Low :Low contrast mode (Brighten the dark portion, and darken the bright portion.) High :High contrast mode (Brighten the bright portion, and darken the dark portion.)
				2. Standard setting: ON
				3. Setting method (1) Select with the keys (Shift + F5 key) on the keyboard. (2) Switch with the scope switch. (3) Switch with RS-232C communication. Note) Assign the scope switch on the user preset screen.

<table>
<tr><th colspan="3">Item</th><th>Specification</th></tr>
<tr><td rowspan="11">4. Observation</td><td rowspan="2">3. Other picture quality adjustment</td><td rowspan="2">3. Freeze</td><td>1. Specifications
Make a moving image a still image.
(Field freeze system)</td></tr>
<tr><td>2. Setting method
(1) Freeze with the freeze switch on the keyboard.
(2) Freeze with the scope switch.
(3) Freeze with RS-232C communication.
Note) Assign the scope switch on the user preset screen.</td></tr>
<tr><td rowspan="2">4. Image display function</td><td rowspan="2">1. Display area change (Electric magnification)</td><td>1. Specifications
(1) The observing image size is selectable.</td></tr>
<tr><td>2. Setting method
(1) Set with the switch (Function key F5) on the keyboard.
(2) Change with the scope switch.
(3) Change with RS-232C communication.
Note) Assign the scope switch on the user preset screen.</td></tr>
<tr><td rowspan="7">5. Input/Output switching function</td><td rowspan="2">1. Standard chart image output</td><td>1. Specifications
100% Color bar is displayed on the screen for adjustment of the monitor.</td></tr>
<tr><td>2. Setting method
(1) Select with the key (Function key F2) on the keyboard.
(2) Select with RS-232C communication.</td></tr>
<tr><td rowspan="5">2. Selection of output signal to the monitor</td><td>1. Specifications
(1) Select the signal to the monitor from the inputs (scope, printer, VTR and digital file).</td></tr>
<tr><td>2. Setting method
(1) Select with the switch on the front panel (Image Source).
(2) Select with RS-232C communication.
<table><tr><td rowspan="2">IMAGE SOURCE</td><td colspan="3">Output to the monitor</td></tr><tr><td>RGB</td><td>Y/C</td><td>VBS</td></tr><tr><td>SCOPE</td><td>○</td><td>○</td><td>○</td></tr><tr><td>PRINTER</td><td>×</td><td>×</td><td>○</td></tr><tr><td>VTR</td><td>×</td><td>○</td><td>○</td></tr><tr><td>D.F.</td><td>○</td><td>×</td><td>×</td></tr></table>・The scope image is displayed at marked ×.
・Switching the monitor image is controlled by the monitor remote signal.</td></tr>
<tr><td rowspan="3">5. Picture quality</td><td rowspan="3">1. Resolution</td><td rowspan="3">1. Luminance Horizontal resolution (Magnify in the horizontal direction so that the aspect ratio (H:V) becomes 4:3 with the vertical magnification rate of 1X, and adjust the view angle.)</td><td>Near the center:
1. 3700/01/08
(1) Composite signal, RGB signal, Y/C signal outputs (240TV lines or more)</td></tr>
<tr><td>2. 3704
(1) Composite signal output (350TV lines or more)
(2) RGB signal, Y/C signal outputs (400TV lines or more)</td></tr>
<tr><td>3. 37071
(1) Composite signal, RGB signal, Y/C signal outputs (400TV lines or more)</td></tr>
</table>

Item			Specification
5. Picture quality	1. Resolution	2. Luminance Vertical resolution (Magnify in the horizontal direction so that the aspect ratio (H:V) becomes 4:3 with the vertical magnification rate of 1X, and adjust the view angle.)	Near the center: 1. 3700/01/08 (1) Composite signal, RGB signal, Y/C signal outputs (320TV lines or more) 2. 3704 (1) Composite signal, RGB signal, Y/C signal outputs (320TV lines or more) 3. 37071 (1) Composite signal, RGB signal, Y/C signal outputs (320TV lines or more)
	2. S/N		1. (37dB or more) [Conditions] AGC: OFF Contrast: Normal Image enhancement: Edge enhancement (Low)
6. Recording	1. Registration and access of patient data		1. Specifications 40 patient data can be registered and accessed. 2. Setting method Input from the keyboard on the patient data screen. 3. Input items (1) ID No. (2) Patient name (3) Sex and age (4) Date of birth (Date of inspection is automatically displayed.)
	2. Recording and displaying of patient data		1. Specifications The patient data to register, the comment to input after registration, the number of video print, etc. can be displayed on the screen. 2. Setting method (1) Input from the keyboard. (2) Input with RS-232C communication. 3. Display items (1) ID No. (2) Patient name (3) Sex and age (4) Date of birth (5) Date of inspection, time (stopwatch) (6) Comment (7) Dr. name (8) (Video print number/divided number) (9) (Image enhancement mode: Enhance level) (10) (Contrast mode) Note) Only the item in ( ) is indicated.

Item		Specification
6. Recording	3. Control of the recording unit (video printer)	1. Specifications (1) #PER PAGE The dividing mode of the video printer connected to the CV can be switched to 1/2/4/N (N: User setting) mode. (2) DEL IMAGE Delete the divided image stored in the printer, then return the cursor to the previous position. (3) PRINT Print out the image stored in the printer. (4) PRINT QTY. The number of prints can be switched to 1/2/4/N(N:User setting) mode. (5) Data can be stored also during printing. Print image can be confirmed. Note) Print out automatically after capturing the images set up in (1).
		2. Setting method (1) Select the type of printer. (2) Control with the exclusive key(PRINTER REMOTE) on the keyboard.
		3. Applicable video printer * NTSC: OEP (OLYMPUS) OEP-3 (OLYMPUS) UP-2900MD (SONY) UP-2950MD (SONY) [UP-1800 (SONY)] [UP-1850 (SONY)] [UP-5000MD (SONY)] [UP-5200MD (SONY)] [UP-5250MD (SONY)] * PAL: OEP (OLYMPUS) UP-2800P (SONY) UP-2850P (SONY) [UP-1800 EPM(SONY)] [UP-1850 EPM (SONY)] [UP-5000MDP (SONY)] [UP-5200MDP (SONY)] [UP-5250MDP (SONY)] UP-2100P Note) [ ] Products already sold. Remote cable: MH-995 (RS-232C) MAJ-854 (X-contact)

Item		Specification
6. Recording	4. VTR recording/playback control	1. Specifications The following operations are possible from the exclusive key on the keyboard, RS-232C and scope switch for the VTR connected to the CV. ・ Recording(REC) ・ Playback(PLAY) ・ Stop(STOP) ・ Fast forward(FWD) ・ Rewind(REW) ・ Pause(PAUSE) ・ Fast forward during playing (RS-232C control only) ・ Rewind during playing (RS-232C control only)
		2. Setting method (1) Use the exclusive key on the keyboard. (2) Use the scope switch. Note) Scope switch can control [REC/REC_PAUSE] only. (Scope switch is assigned to [VTR]).
		3. Applicable VTR * NTSC VO-7600 (SONY) VO-9600 (SONY) SVO-9500MD (SONY) [BR-S611 (JVC)] [BR-S811 (JVC)] * PAL VO-7630 (SONY) VO-9600P (SONY) SVO-9500MDP (SONY) [BR-S611E (JVC)] [BR-S811E (JVC)]
	5. Release continuous recording	1. Specifications Release of each connected unit can be controlled from the CV-160.
		2. Setting method (1) Release with the scope switch. (2) Release from the keyboard. Note) Assign the scope switch on the user preset screen.
		3. Controllable units (1) Applicable video printers (2) Applicable digital files
7. Connection	1. Scope	Connect the scope and CV-160 with the scope cable(MAJ-843).
	2. OES video converter	Can be directly connected to the CV-160.
8. Panel	1. Display	(1) English 100 to 120V: NTSC (OAI, OLA 1) 220 to 240V: PAL (OLA 2) (2) Symbol 220 to 240V: PAL (OE)
	2. Structure	Dripproof required as medical equipment.

<table>
<tr><th colspan="2">Item</th><th colspan="3">Specification</th></tr>
<tr><td>8. Panel</td><td>3. Storage</td><td colspan="3">(1) Storage items
Color tone set value
Image enhancement level
Iris mode,
White balance data.</td></tr>
<tr><td>9. For cleaning</td><td>1. Panel</td><td colspan="3">To remove dust, dirt, and non-patient debris, wipe the unit using a soft, lint-free cloth moistened with 70% ethyl or isopropyl alcohol. If the unit is soiled with blood or other potentially infectious materials, first wipe off all gross debris using neutral detergent and then decontaminate its surface using lint-free cloth moistened with 70% ethyl or isopropyl alcohol.</td></tr>
<tr><td rowspan="8">10. Safety</td><td rowspan="8">1. Laws and regulations applied</td><td>Country/area</td><td>Laws and regulations applied</td><td>Standards to be conformed to</td></tr>
<tr><td>1. EU/FETA</td><td>MDD</td><td>Class: Class I
EN 60601-1
EN 60601-1-1
EN 60601-1-2
EN 60601-1-2-18
IEC 513
IEC 529
ISO 9000-3
ISO 3740
ISO 8600-1
ISO 8600-1.3</td></tr>
<tr><td rowspan="2">2. USA</td><td>Medical Equipment Safety Laws (510K)</td><td>Class: Class II</td></tr>
<tr><td>UL/C-UL</td><td>UL544
CSA22.2 No. 125</td></tr>
<tr><td>3. Japan/ Korea</td><td>The Drugs, Cosmetics and Medical Instruments Act
General name:
Light source, processor
Approval No.
07BZ0043</td><td>JIST1001 (medical electronics safety)
JIST1002 (medical electronics safety test)</td></tr>
<tr><td colspan="2">Classification of medical instruments</td><td></td></tr>
<tr><td colspan="2">OAI/Asia</td><td>Protection type against an electrical shock: Class I
Protection level against an electrical shock: BF type</td></tr>
</table>

<table>
<tr><th colspan="2">Item</th><th colspan="2">Specification</th></tr>
<tr><td rowspan="1">10. Safety</td><td>1. Laws and regulations applied</td><td>EU area (OE)</td><td>Protection type against an electrical shock:
Class I
Protection level against an electrical shock:
BF type
Note) When the fitting part has no indication of protection level against an electric shock, it is the BF type fitting part.</td></tr>
<tr><td rowspan="3">11. Others</td><td>1. Dimensions (maximum outer dimensions)</td><td colspan="2">370 (W) × 72 (H) × 420 (D) mm</td></tr>
<tr><td>2. Weight</td><td colspan="2">8kg</td></tr>
<tr><td>3. Standard setting of display/function</td><td colspan="2">Front panel
<table>
<tr><th></th><th>Function/display</th><th>Factory setting</th><th>Reset</th><th>Power ON</th></tr>
<tr><td rowspan="10">Front Panel</td><td>Image selection (IMAGE SOURCE)</td><td>SCOPE</td><td>SCOPE</td><td>SCOPE</td></tr>
<tr><td>IRIS</td><td>AVE</td><td>User Preset1 IRIS</td><td>Stored</td></tr>
<tr><td>ENH</td><td>L</td><td>User Preset1 ENH.Pos.</td><td>Stored</td></tr>
<tr><td>R</td><td>±0</td><td>±0</td><td>Stored</td></tr>
<tr><td>B</td><td>±0</td><td>±0</td><td>Stored</td></tr>
<tr><td>C</td><td>±0</td><td>±0</td><td>Stored</td></tr>
<tr><td>SELECT</td><td>Not selected</td><td>Not selected</td><td>Not selected</td></tr>
<tr><td>WB</td><td>– (Cleared)</td><td>Stored</td><td>Stored</td></tr>
</table></td></tr>
</table>

Item		Specification
11. Others	3. Standard setting of display/function	System Setup

System setup

Function/display	Factory setting	Reset	Power ON
[Printer]			
Type	OEP	Stored	Stored
Qty.,"N"	4	Stored	Stored
Caption	– (Cleared)	Stored	Stored
[Release Time]			
Printer	0.5	Stored	Stored
D.F.	2	Stored	Stored
[Clock]			
Date	Note 1	Stored	Stored
Time	Note 1	Stored	Stored
Disp.	Note 1	Stored	Stored
[Patient Data]	Resume	Stored	Stored
[Remote Control]			
Mon. Type	OEV2	Stored	Stored
Mon. VTR	S-Video	Stored	Stored
VTR	RS-232C	Stored	Stored
[Light Source]	CLV	Stored	Stored
[Network]			
Use DHCP	No	Stored	Stored
IP Address	Note 2	Stored	Stored
Net Mask	255.255.255.0	Stored	Stored

Note 1) Set to the local time on shipment.
Note 2) The high order 3-byte of the initial IP address is 192.168.0. The lower order 1-byte is the fixed value for each CPU number.

User Preset

User Preset

Function/display	Factory setting	Reset	Power ON
[Scope Switch]			
Switch1	Freeze	Stored	Stored
Switch2	Iris	Stored	Stored
Switch3	Enhance	Stored	Stored
Switch4	Release	Stored	Stored
[Image Size]			
160	Medium	Stored	Stored
Q160	Semi-Full	Stored	Stored
XP160	Small	Stored	Stored
[Image Control]			
Iris	Ave	Stored	Stored
AGC	On	Stored	Stored
Contrast	Normal	Stored	Stored
Enh.Pos.	Low	Stored	Stored
Enh.Type	Str.	Stored	Stored
Enh.Low	1	Stored	Stored
Enh.Med.	3	Stored	Stored
Enh.High	5	Stored	Stored

Item		Specification
11. Others	3. Standard setting of display/function	Patient Data

	Function/display	Factory setting	Reset	Power ON
Patient Data	ID No.	Cleared	Stored	Stored
	Name	Cleared	Stored	Stored
	Sex	Cleared	Stored	Stored
	D.O.Birth	Cleared	Stored	Stored
	Age	Cleared	Stored	Stored
	Phy.Name	Cleared	Stored	Stored

Scope Info.
(1) For the user

	Function/display	Factory setting	Reset	Power ON
Scope Information	**[Scope Infomation]**			(Data read out from the scope)
	Scope Model	Stored	Stored	
	Serial No.	Stored	Stored	
	Comments	Cleared	Cleared	
	Cumulative Uses	Cleared	Stored	
	Check Period	1 8 0	Stored	
	Service Contract	Cleared	Stored	
	Warranty Date	Cleared	Stored	
	Owner	Cleared	Stored	
	Customer ID No.	Cleared	Stored	
	ID Ver.	Cleared	Stored	

(2) For service

	Function/display	Factory setting	Reset	Power ON
Ctrl+Shift+Scope Information	**[Scope Infomation]**			(Data read out from the scope)
	Scope Model	Stored	Stored	
	Serial No.	Stored	Stored	
	Comments	Cleared	Cleared	
	Cumulative Uses	Cleared	Stored	
	Check Period	180	Stored	
	Service Contract	Cleared	Stored	
	Warranty Date	Cleared	Stored	
	Owner	Cleared	Stored	
	Customer ID No.	Cleared	Stored	
	ID Ver.	Cleared	Stored	
	Mfg. Comments	Cleared	Stored	
	Service Comments	Cleared	Stored	
	Repair Info.	Cleared	Stored	
	Checkup Info.	Cleared	Stored	

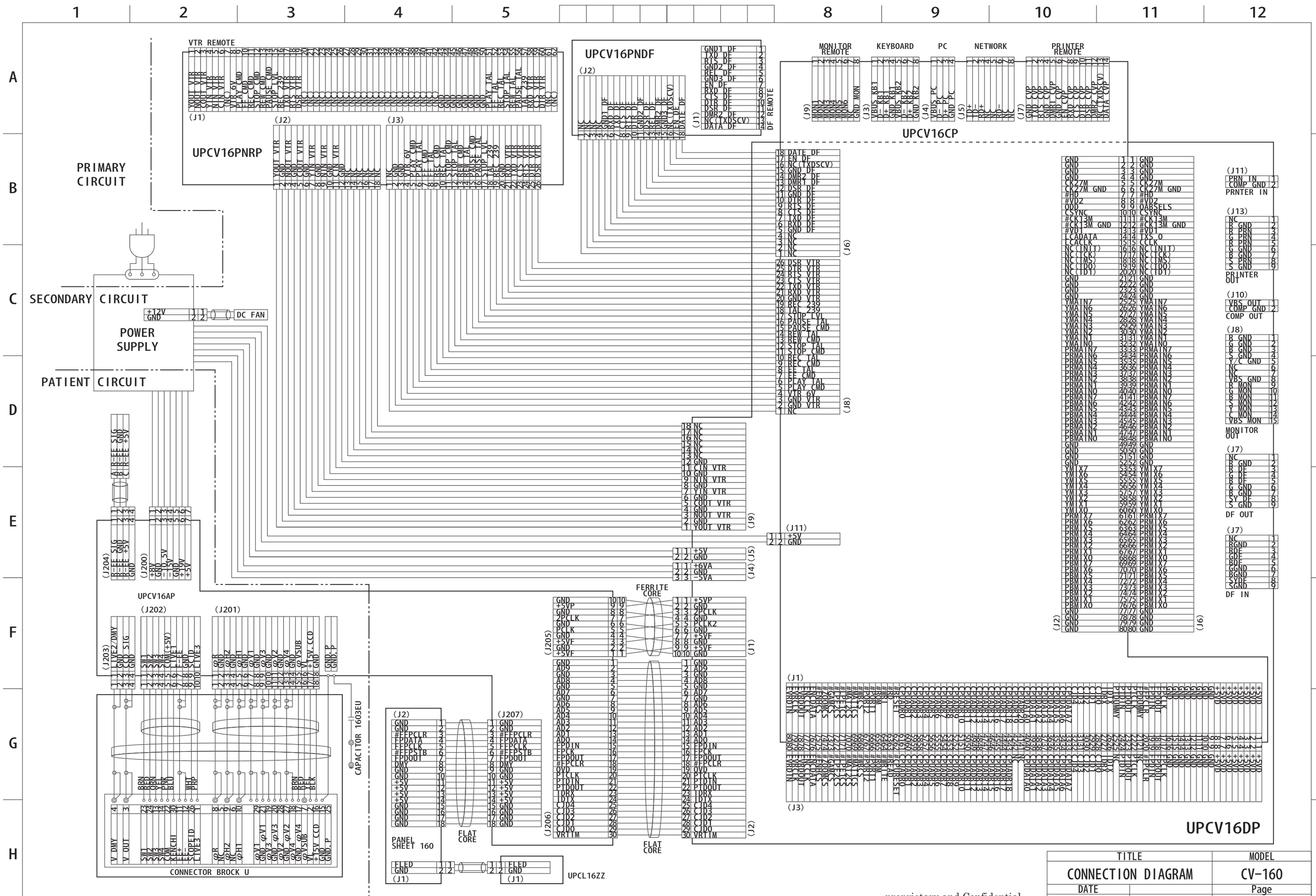
* Press the Ctrl + Shift + Scope Info. keys on the keyboard to shift from the Scope Information screen to the above screen.

Item		Specification
11. Others	3. Standard setting of display/function	Hidden screen

Ctrl+Shift+Systemsetup

Function/display	Factory setting	Reset	Power ON
[Shipping]			
Country	Destination	Stored	Stored
[Printer]			
Print Time	40	Stored	Stored
Auto Clear	ON	Stored	Stored
[Color]			
Mon.Red	±0	Stored	Stored
Mon.Blue	±0	Stored	Stored
Prt.Red	±0	Stored	Stored
Prt.Blue	±0	Stored	Stored
[Clock]			
Total	–	Stored	Stored
Trim	±0	Stored	Stored
[CPU Board]	—		
Serial No.	–	Stored	Stored
[Video Board]	–	Stored	Stored
[Pat.Board]			
Iris spd.	Med.	Stored	Stored
Iris L	1	Stored	Stored
Iris D	1	Stored	Stored

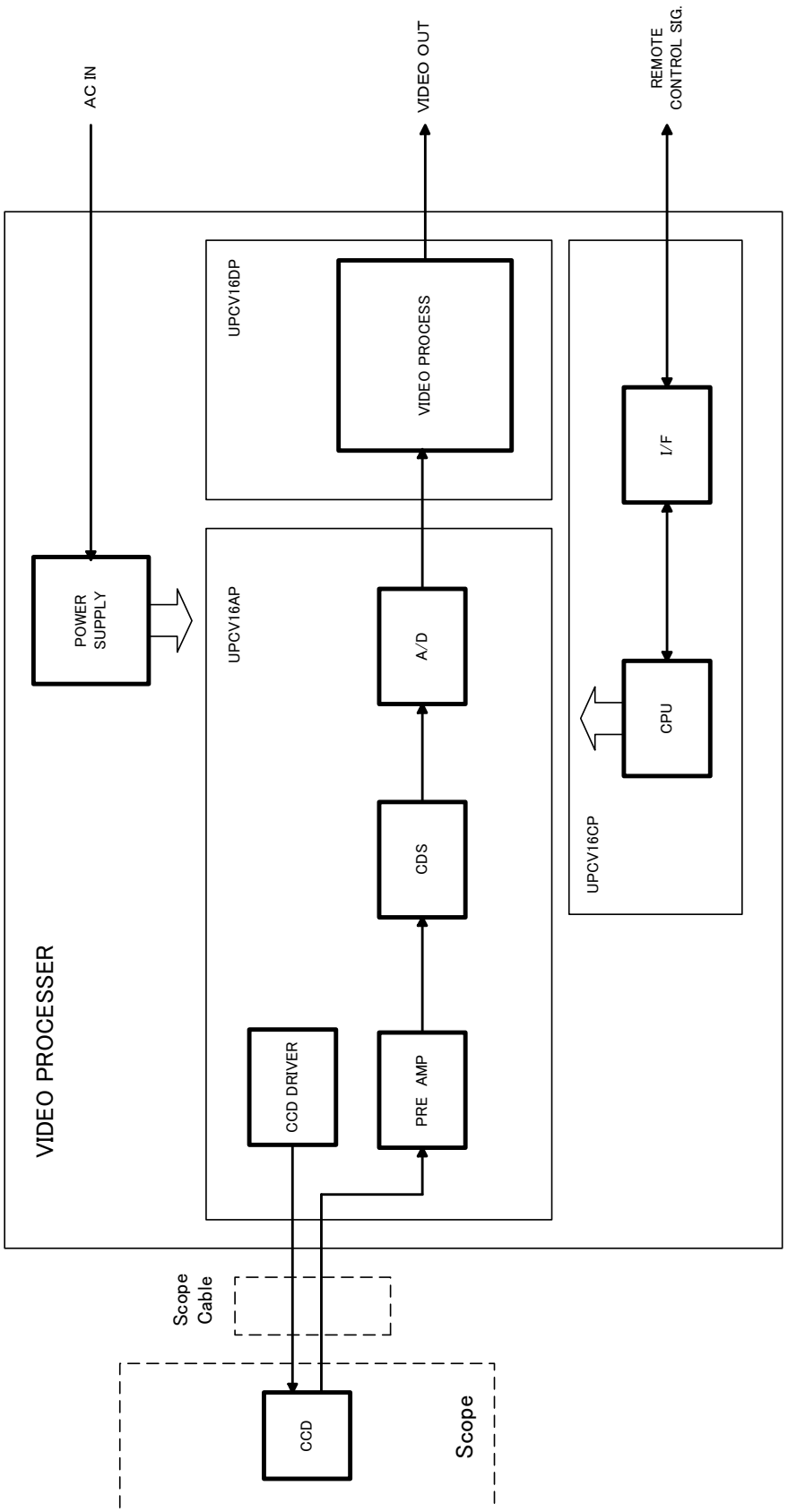
Press the Ctrl + Shift + System Setup keys on the keyboard to shift from the System Setup screen to the above screen.



proprietary and Confidential

TITLE	MODEL
CONNECTION DIAGRAM	CV-160
DATE	Page
2000-04	1/1

BLOCK DIAGRAM



TROUBLESHOOTING

1. Contents

2. CV-160 troubleshooting	1. Defective units	4-2
	2. Symptoms and object units	4-2

2. CV-160 troubleshooting

2-1 Defective units

	Unit
A	AP (patient) board (UPCV16Apxx)
B	DP (video) board (UPCV16DPxx)
C	CP (CPU) board (UPCV16CPxx)
D	FP (front panel) unit
E	RP (rear) board
F	SWP (power supply) unit
G	Connector block unit (including harness)
H	AP-DP flat harness
I	AP-DP coaxial harness
J	AP-FP flat harness
K	RP-DP flat harness
L	RP-CP flat harness
M	DF board & harness (CV-160 only)
N	Light control cable harness
O	Keyboard
P	FPLED (front panel power SWLED) board (UPCL)

2-2 Symptoms and object units

- The following table shows the order of checking doubtful units when a defect occurs.

※ For the relation with the alphabets of the object units, refer to 2-1 Defective units.

No.	Symptom	Order of checking doubtful units					
		1	2	3	4	5	6
1	Character is blurring.	B	C				
2	Character is fluctuating.	B	F				
3	Character is flying.	C					
4	Character is not displayed.	B	C				
5	Character is displaced.	B	C				
6	RGB signal is not obtained.	B					
7	Y/C signal is not obtained.	B					
8	Composite signal is not obtained.	B					
9	Keyboard is not accepted.	O	C				
10	Smears	A					
11	Single noises appear in the horizontal/vertical direction.	A					
12	Blooming	A					
13	Mosaic-like noises appear on the scope image.	B	C	A	H		
14	Digital noises or other noises appear.	B	A	H			
15	Horizontal stripes appear on the screen.	A	B				
16	Vertical stripes appear on the screen.	A	B				
17	Vertical wave noises	A	N	F			
18	Contour line noises	B	A	C			
19	High frequency application noises	A					
20	Mask shape is defective.	C					
21	The image in the mask is displaced.	H	A	B			
22	The screen is unstable.	B	A	C	F		
23	Monochrome image is displayed.	B	C				
24	Noises appear on the magnified screen.	B	C				
25	Color reproductions of RGB, Y/C and composite signal are bad.	B	A	C			
26	Color reproduction of only the RGB signal is bad.	B					

No.	Symptom	Order of checking doubtful units					
		1	2	3	4	5	6
27	Color reproduction of only the Y/C signal is bad.	B					
28	Color reproduction of only the composite signal is bad.	B					
29	The hue is abnormal.	J	H	C	D		
30	The endoscopic image is not displayed.	I	H	A	B	F	C
31	The endoscopic image is wavering.	H	A	B			
32	Image enhancement is strong.	B	C				
33	Image enhancement is weak.	B	C				
34	Image enhancement does not function.	B	C				
35	The AGC malfunctions.	A	C				
36	Latitude is narrow.	A	B				
37	The screen is hunching.	A	C				
38	The screen is dark.	N	G	A			
39	The screen is bright.	N	G	A			
40	The automatic light control responds late.	A	C				
41	The automatic light control does not function.	N	G	A			
42	The digital image is abnormally displayed.	B	C				
43	The screen sways.	B	C				
44	Sandstorm-like noises	B	C				
45	The screen is white.	B	C				
46	The screen is black.	B	C				
47	AGC is not switched.	O	C	A			
48	LED is not lit on the front panel.	J	H	F			
49	The power switch LED is not lit.	J	H	P	F		
50	VTR is not controlled.	C	L	E			
51	Video printer is not interlocked.	C					
52	Buzzer does not sound.	C					
53	Fail to freeze (from the scope switch).	G	A	C	B		
54	Fail to freeze (from the keyboard).	O	C	B			
55	Fail to release the freeze (from the scope switch).	G	A	C			
56	Fail to release the freeze (from the keyboard).	O	C				
57	Fail to release (from the scope switch).	G	A	C			
58	Fail to release (from the keyboard).	O	C				
59	White balance is invalid.	C	B	A			
60	Fail to switch the output.	D	C	B			
61	Fail to change the measurement mode.	D	C	A			
62	Fail to change the contrast.	O	C	B			
63	Color tone step is invalid.	J	H	F	C	D	
64	Data is not stored.	C					
		1	2	3	4	5	6

DISASSEMBLING/ASSEMBLING PROCEDURE

1. General Precautions on Disassembling/Assembling

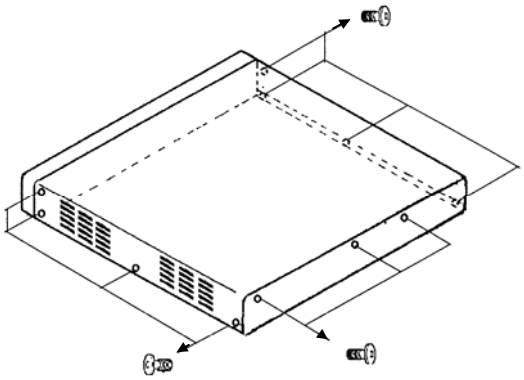
- Replace the parts and wires to the original positions.
- For electrical safety and standard, be sure to reassemble the following parts to the original states.
  ① Insulation tube and mylar sheet
  ② Cables clamped and separated from the heating parts or high-voltage parts
  ③ Cover screws with a toothed lock washer to suppress a radiation noise
- Use the specified parts.
- The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
- Be careful when disconnecting the cable housing.
- Don't pull the cable. Be sure to use the special tool.
- Be careful not to be injured.
  Some metallic parts have sharp corner or edge. Be careful when handling such parts.
- Be sure to observe the specified torque and dimensions.
  Observe the torque and dimensions when they are specified.
  As for the H-band which secures each tube, first tighten it by the specified torque and then pull the tube to check whether the tube becomes loose or it comes off.
- Clean the parts to be used.
  When re-using the same parts, eliminate the sealing material and tape and clean. For the O-ring and packing, clean the surface of the parts on which the O-ring or packing is mounted. Otherwise, it may cause water leakage.
- Don't forget to tighten the screws and nuts.
  Failure in tightening the screws and nuts may cause water leakage.

2. Jigs and Tools

No	Name	No.	Specification	Remarks
1	Monkey wrench	OT0537		
2	Phillips screwdriver No. 2	OT0376		
3	Phillips screwdriver No. 1	OT0544		
4	Precision screwdriver	OT0011		
5	Box screwdriver set	OT0545		
6	L-wrench	OT0215		
7				
8				

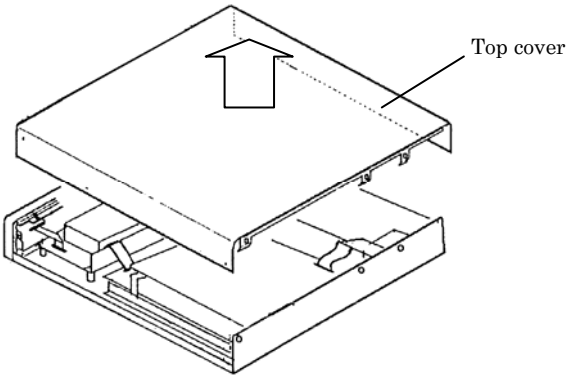
3. Disassembling Procedure

3-1. Top cover



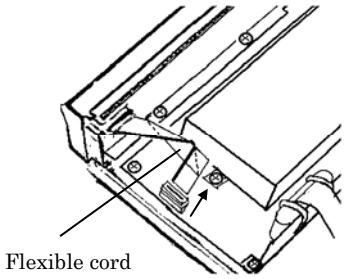
(1) Remove the eleven screws (HCBK3x6SA) that secure the top cover.

Phillips screwdriver No. 2

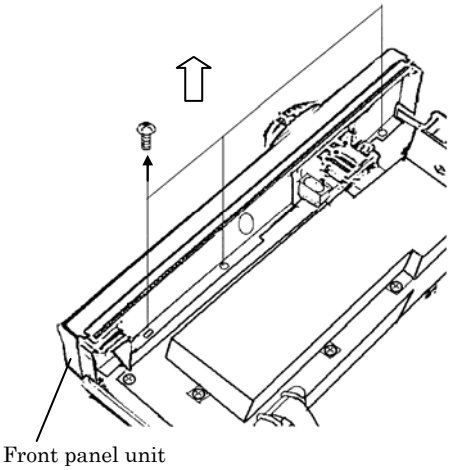


(2) Remove the top cover from the main unit.

3-2. Front panel unit



(1) Remove the flexible cord from the connector as shown on the left.

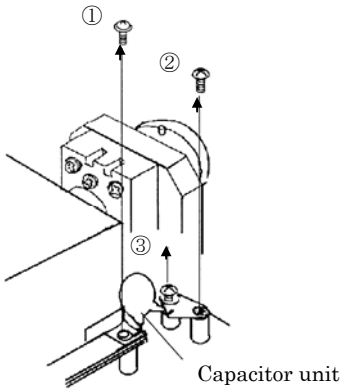


(2) Remove the three screws (CCUK3x4SZ) that secure the front panel unit.

Phillips screwdriver No. 2

(3) Remove the front panel unit from the main unit.

3-3. Connector block unit



(1) Remove the screw (① CCUK3x6SZ) that secures the capacitor unit.

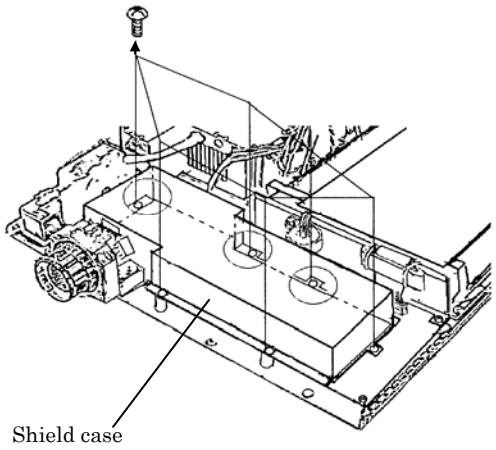
Phillips screwdriver No. 2

(2) Remove the two screws (②/③ CBK3x6SA) that secure the capacitor unit.

Phillips screwdriver No. 2

(3) Remove the capacitor unit.

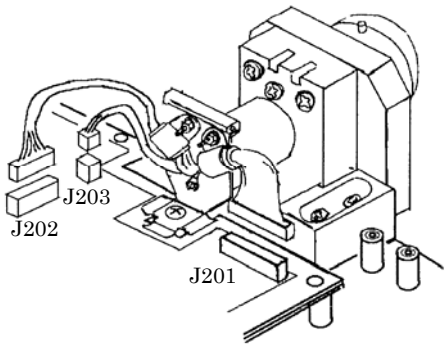
※ Tighten the screws ① to ③ completely when assembling the unit.



(4) Remove the six screws (CCUK3x6SZ) that secure the shield case.

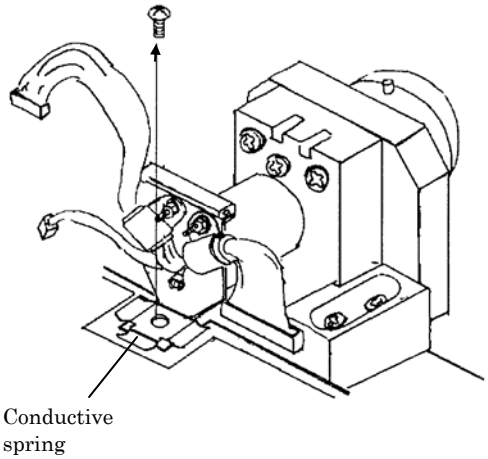
Phillips screwdriver No. 2

(5) Remove the shield case from the main unit.



(6) Remove the connector as shown on the left.

※ When assembling the unit, check that the connector is securely inserted.



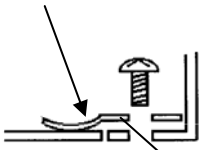
(7) Remove the screw (CCUK3x6SZ) that secure the conductive spring.

Phillips screwdriver No. 2

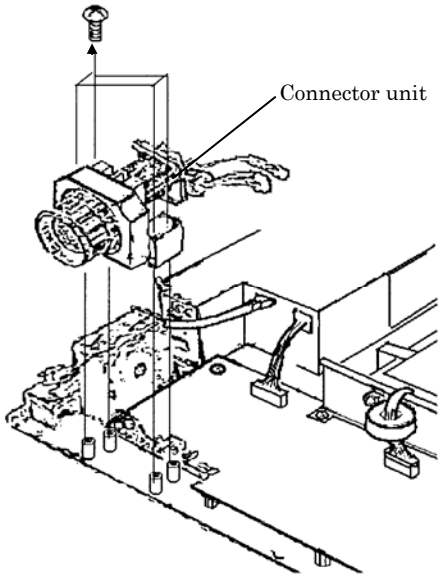
(8) Remove the conductive spring.

※ Precaution on assembling

Set the conductive spring with the convex side down.



★ The conductive spring shall not interfere with the parts mounted on the board.

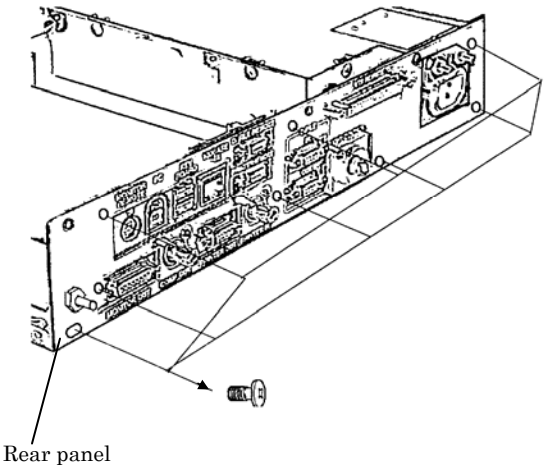


(9) Remove the four screws (CCUK4x10SZ) that secure the connector unit.

Phillips screwdriver No. 2

(10) Remove the connector unit from the main unit.

3-4. CPU board (UPCV16CPxx) and video board (UPCV16DPxx)

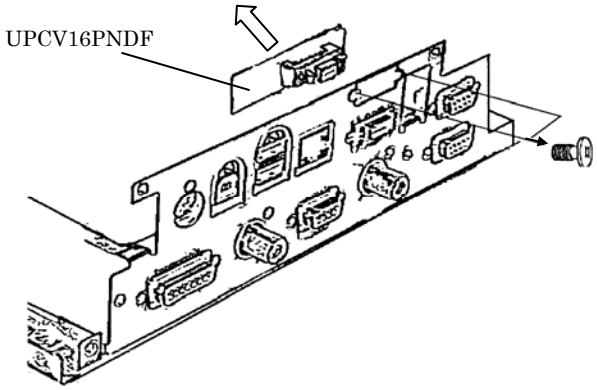


(1) Remove the cables from the CPU board, the video board and the rear panel.

(2) Remove the eight screws (HCBK3x6SA) that secure the rear panel.

Phillips screwdriver No. 2

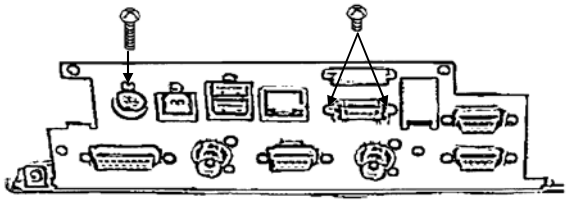
(3) Remove the rear panel.



(4) Remove the two screws (CBK2.5x4SA) that secure the UPCV16PNDF.

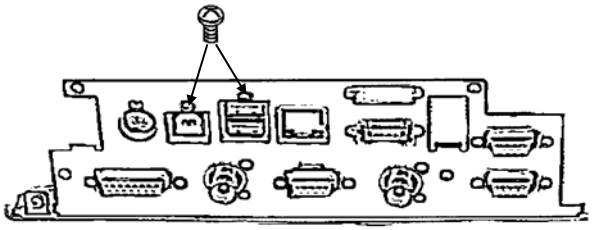
Phillips screwdriver No. 1

(5) Remove the UPCV16PNDF.



(6) Remove the screw (CBK2.5x8SA) that secure the connector of the CPU board.

Phillips screwdriver No. 1

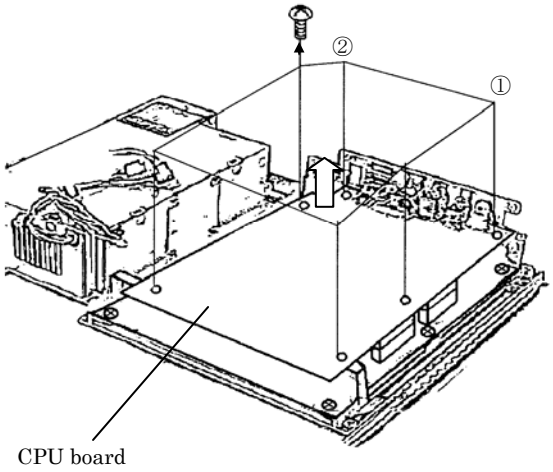


(7) Remove the two screws (CBK2.5x4SA) that secure the connector of the CPU board.

Phillips screwdriver No. 1

(8) Remove the two screws (CUKSK3x6SA) that secure the connector of the CPU board.

Phillips screwdriver No. 2

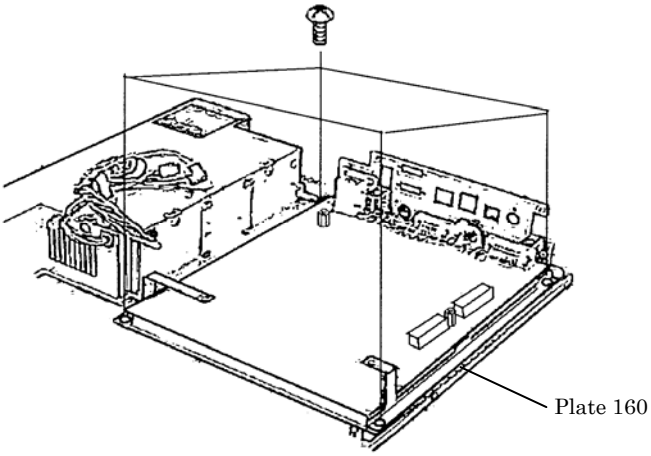


(9) Remove the six screws (CCUK3x6SZ) that secure the CPU board.

Phillips screwdriver No. 2

(10) Remove the CPU board from the main unit.

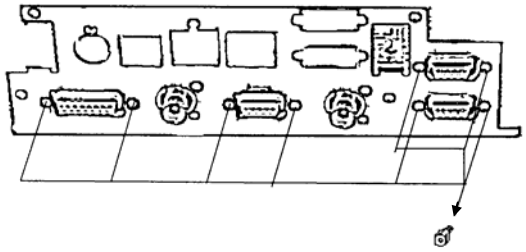
※ When assembling, tighten optionally after the screws ① and ②.



(11) Remove the four screws (CCUK3x4SZ) that secure the plate 160.

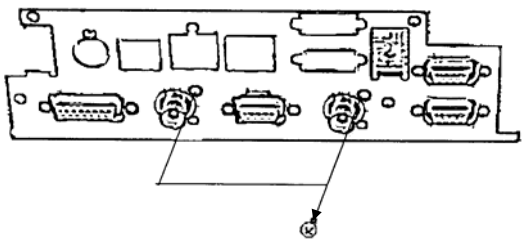
Phillips screwdriver No. 2

(12) Remove the plate 160 from the main unit.



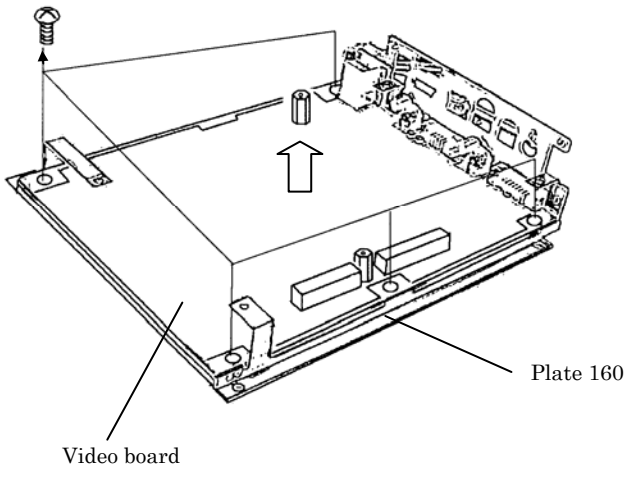
(13) Remove the eight screws (DK774300) that secure the connector of the video board.

Box screwdriver (opposite side 5mm)



(14) Remove the two screws (T2CUK3x10SA) that secure the connector of the video board.

Phillips screwdriver No. 2

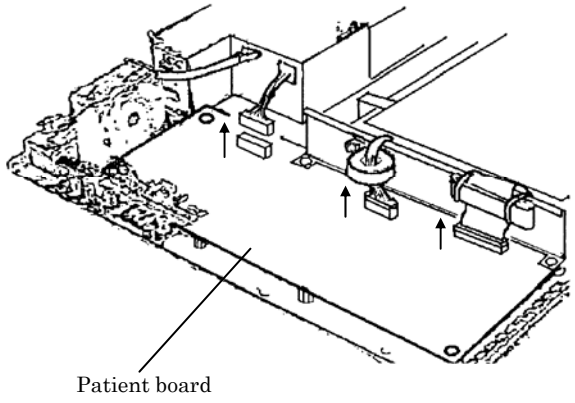


(15) Remove the five screws (CCUK3x4SZ) that secure the video board.

Phillips screwdriver No. 2

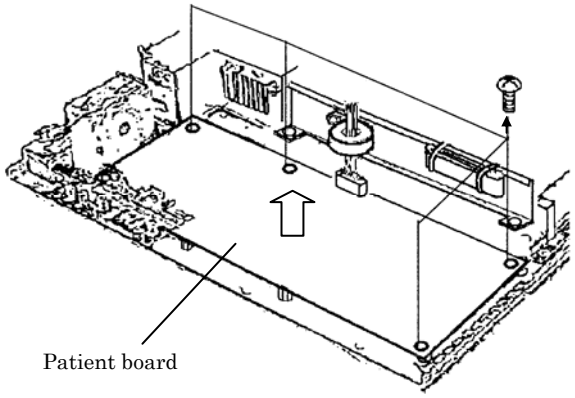
(16) Remove the video board from the plate 160.

3-5. Patient board (UPCV16Apxx)



(1) Do steps (6) and (7) of 3-3. Connector block unit.

(2) Remove the connector from the patient board.

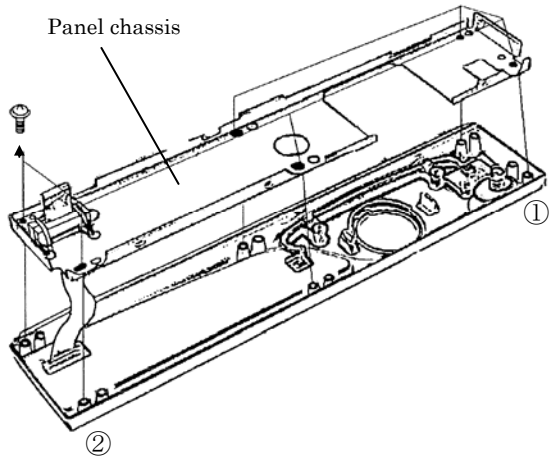


(3) Remove the four screws (CCUK3x6SZ) that secure the patient board.

Phillips screwdriver No. 2

(4) Remove the patient board from the main unit.

3-6. Front panel LED board (UPCL)



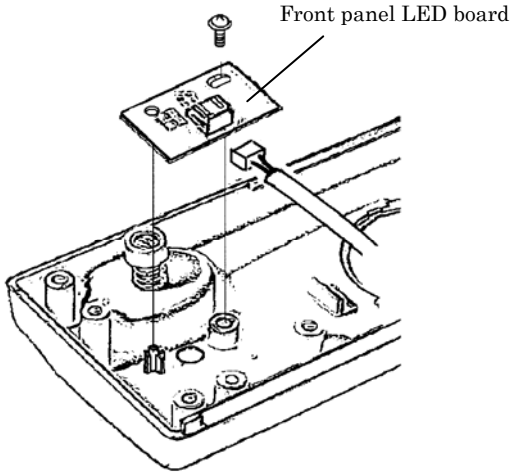
(1) Remove the six screws (T2CCUK3x8SZ) that secure the panel chassis.

Phillips screwdriver No. 2

(2) Remove the panel chassis from the main unit.

※ When assembling, tighten optionally after the screws ① and ②.

Note) The unused hole is the spare when the screw becomes loose.



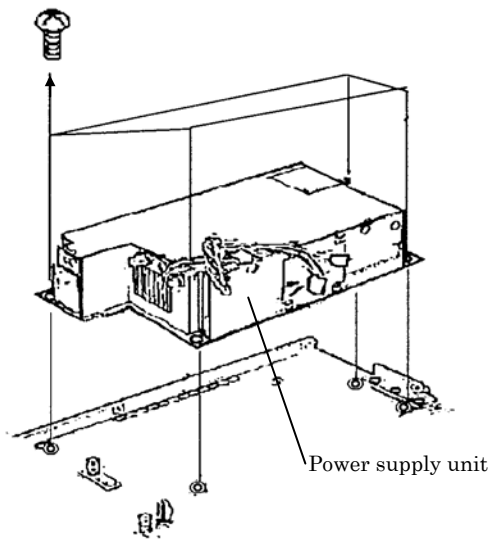
(3) Remove the connector.

(4) Remove the screw (T2CCUK3x8SZ) that secures the front panel LED board.

Phillips screwdriver No. 2

(5) Remove the front panel LED board from the main unit.

3-7. Power supply unit



(1) Remove the cable from the connectors of the CPU board and the video board.

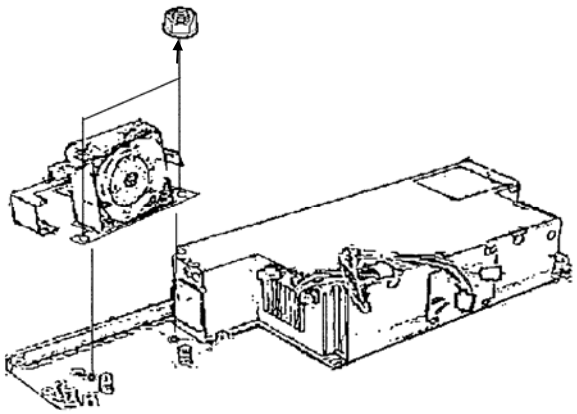
(2) Remove the connector from the fan unit.

(3) Remove the four screws (CCUK3x4SZ) that secure the power supply unit.

Phillips screwdriver No. 2

(4) Remove the power supply unit from the chassis.

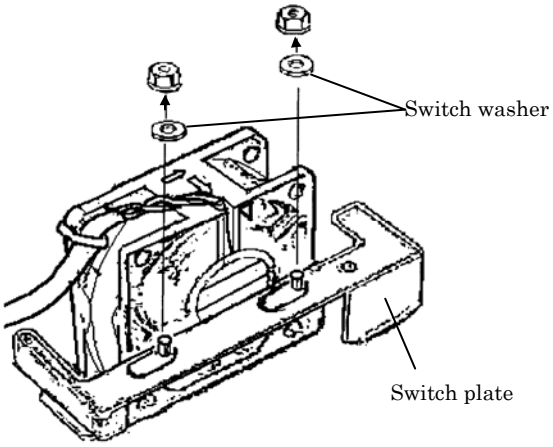
3-8. Fan and switch unit



(1) Remove the two nuts (C6N3Z) that secure the fan and the switch unit.

Box screwdriver (opposite side 5.5mm)

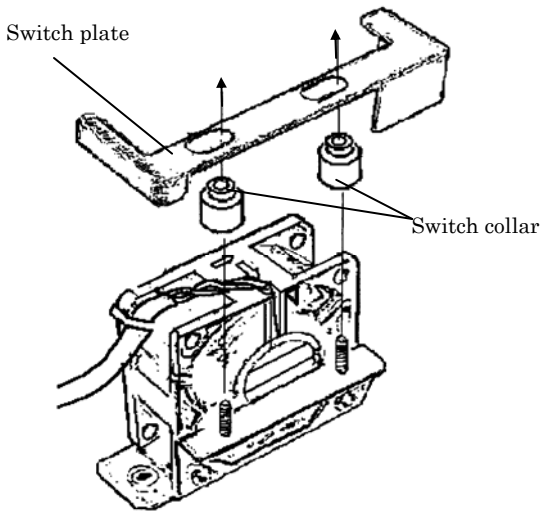
(2) Remove the fan and the switch unit from the chassis.



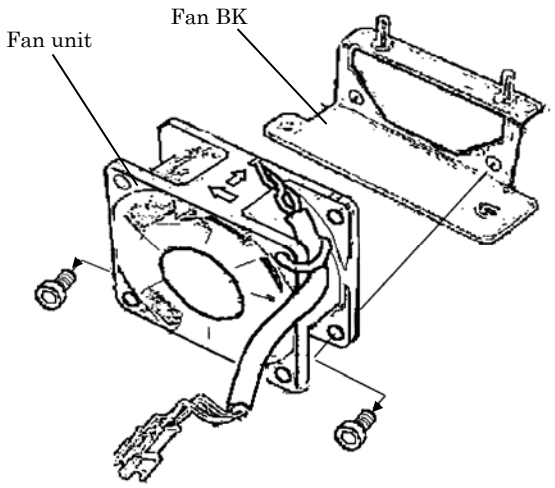
(3) Remove the two nuts (CCUK3x6SZ) and two switch washers that secure the switch plate.

Box screwdriver (opposite side 5.5mm)

※ Precaution on assembling
Assemble so that the switch plate moves smooth.



(4) Remove the switch plate and the switch collar.



(5) Remove the two screws (ABSB3x8SZ) that secure the fan unit.

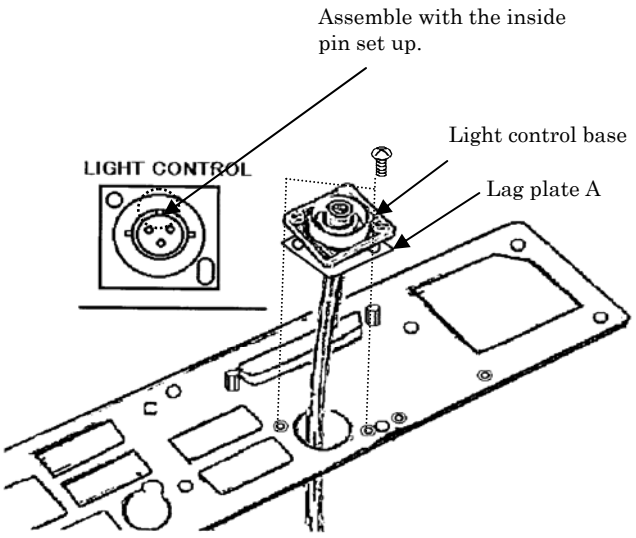
L-wrench set

(6) Remove the fan unit from the fan BK.

4. Assembling Procedure

Reverse the disassembling procedure.
Pay attention to the direction of the parts when assembling the following part.

4-1. Light control cable

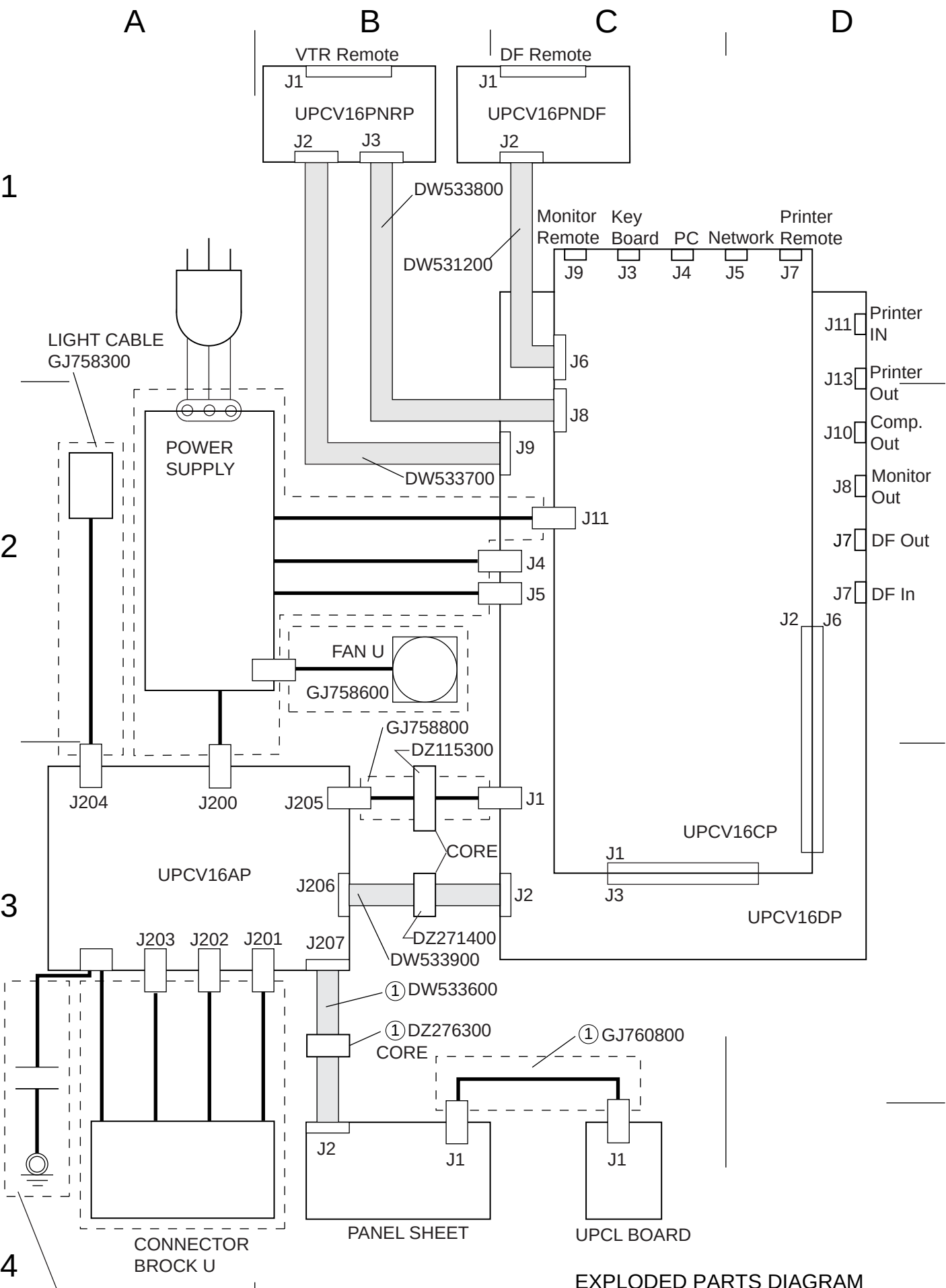


(1) Pass the light control cable through the hole marked “LIGHT CONTROL”.

※ Pay attention to the direction.
※ Take care that the lag plate A does not project from the light control base.

(2) Secure the light control cable with two screws (CBK3x6SA).

Phillips screwdriver No. 2



EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1181
CV-160	CABLE	FIG.5/5
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

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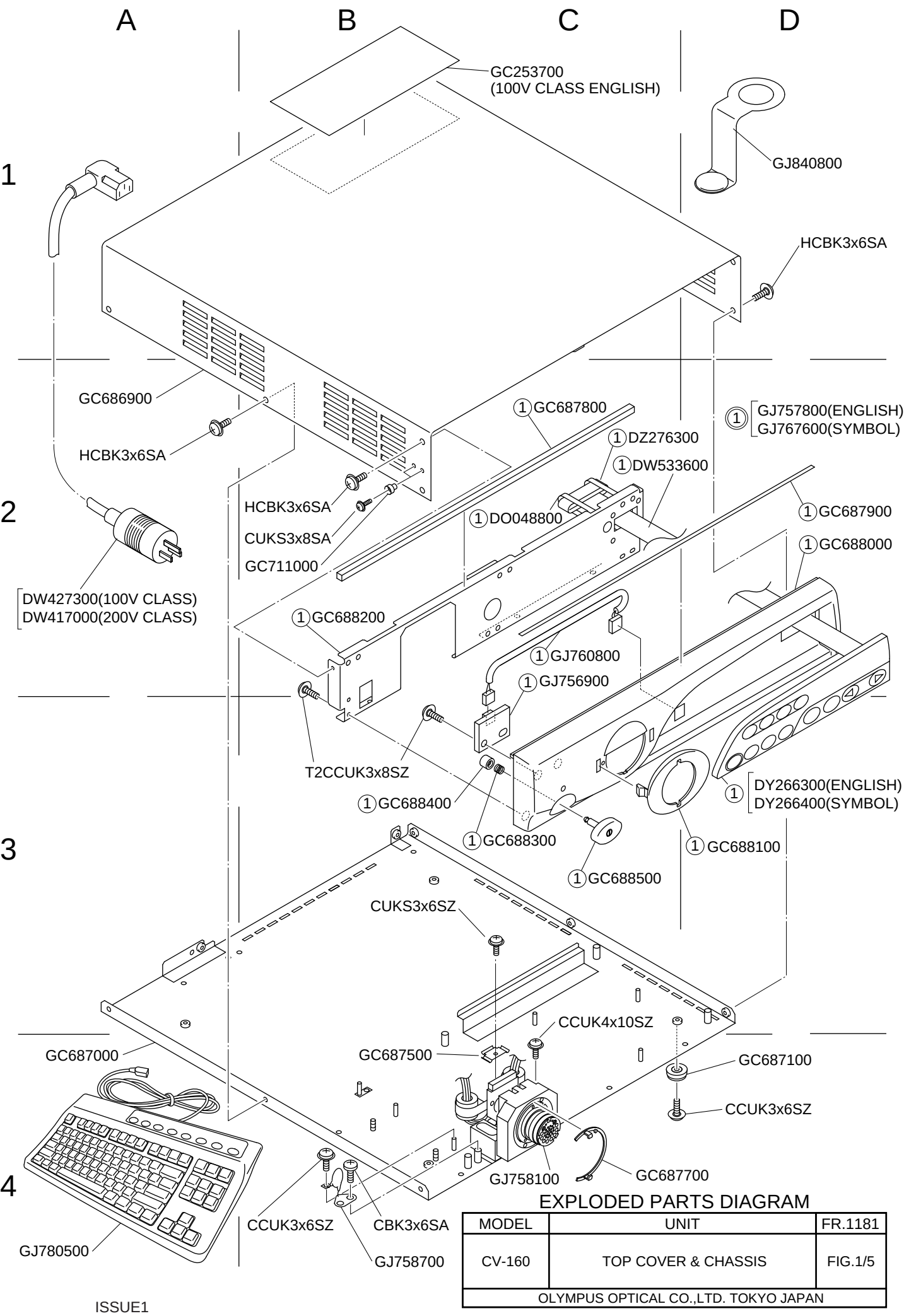

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1181
CV-160	TOP COVER & CHASSIS	FIG.1/5
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

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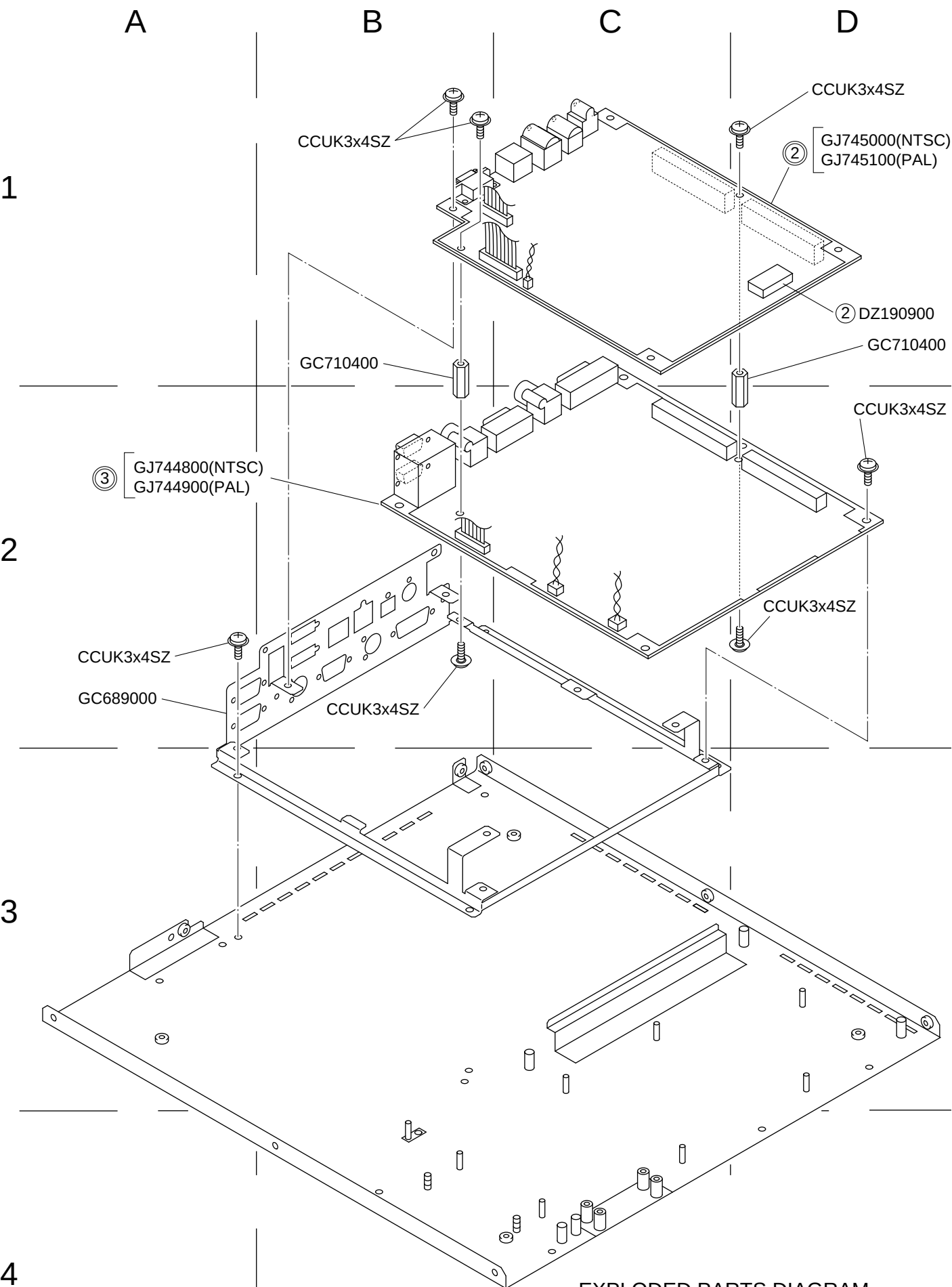

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1181
CV-160	PC BOARD	FIG.2/5
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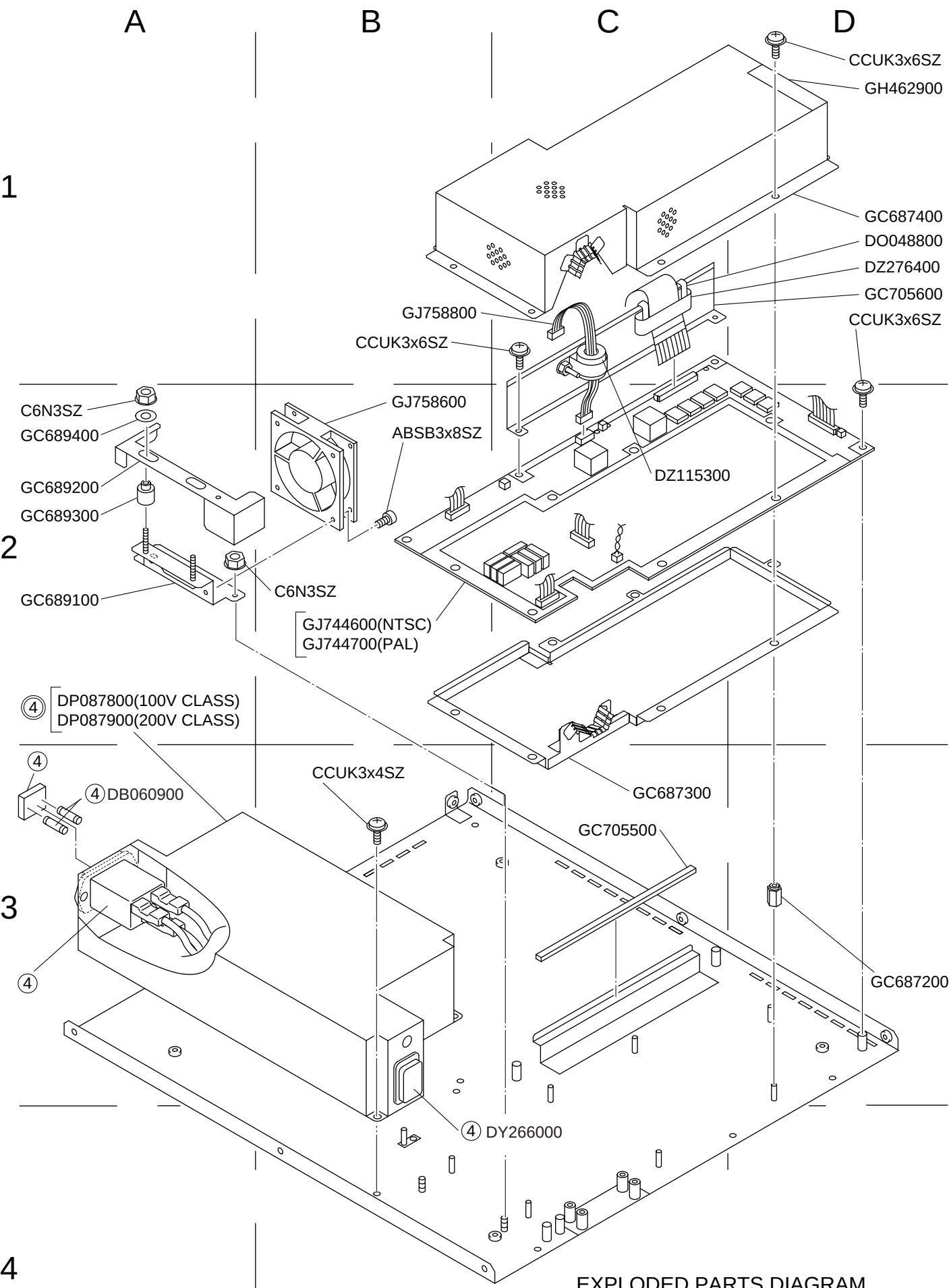

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1181
CV-160	POWER SUPPLY	FIG.3/5
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

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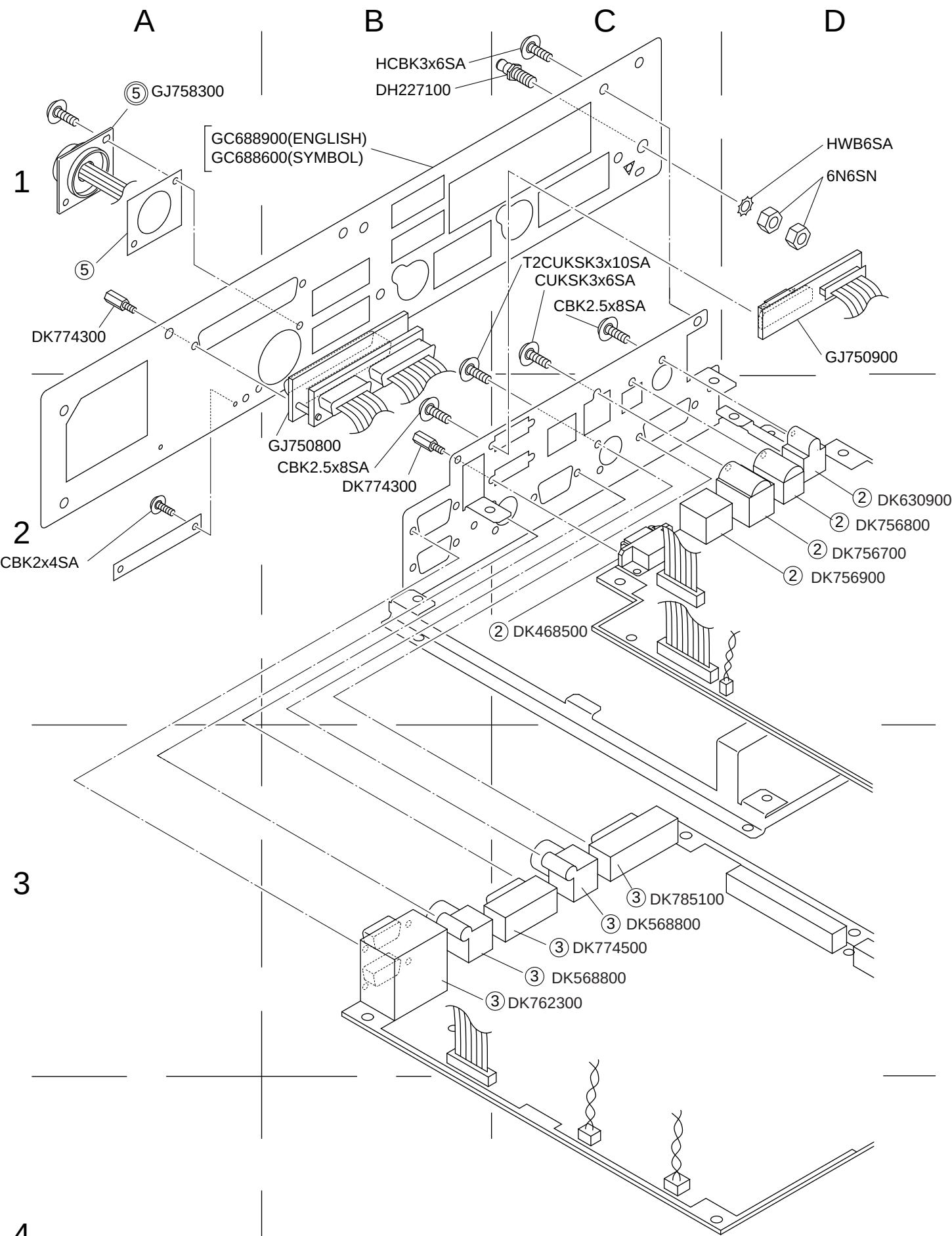

EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1181
CV-160	REAR PANEL	FIG.4/5
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PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
DB060900	3-A3	FUSE			-
DH227100	4-B1	TERMINAL			-
DK468500	4-C2	PC CONNECTOR	Printer Remote		-
DK568800	4-C3	PC CONNECTOR	Comp Out,Printer IN		-
DK630900	4-D2	PC CONNECTOR	Monitor Remote		-
DK756700	4-D2	PC CONNECTOR	Key Board		-
DK756800	4-D2	PC CONNECTOR	PC		-
DK756900	4-D2	PC CONNECTOR	Net work		-
DK762300	4-C3	PC CONNECTOR	DF IN/Out		-
DK774300	4-A1	SCREW			-
DK774500	4-C3	PC CONNECTOR	Printer Out		-
DK785100	4-C3	PC CONNECTOR	Monitor Out		-
DO048800	1−C2	CABLE HOLDER			-
DP087800	3-A2	POWER SUPPLY		100V CLASS	-
DP087900	3-A2	POWER SUPPLY		200V CLASS	-
DW417000	1-A2	POWER CABLE 2U		200V CLASS	-
DW427300	1-A2	POWER CABLE 1U		100V CLASS	-
DW531200	5-B1	CABLE	CPU - DF Board		-
DW533600	1−C2	CABLE	Patient - Panel Sheet		-
DW533700	5-B2	CABLE	Video - Rear Panel Board		-
DW533800	5-B1	CABLE	CPU - Rear Panel Board		-
DW533900	5-B3	CABLE	Video - Patient		-
DY266000	3-B4	PUSH BUTTON SW			-
DY266300	1−D3	PANEL SHEET160E		ENGLISH	-
DY266400	1−D3	PANEL SHEET160S		SYMBOL	-
DZ115300	3-C2	FERRITE CORE			-
DZ190900	2-D1	BATTERY			-
DZ276300	1-C2	FLAT CORE			-
DZ276400	3-D1	FLAT CORE			-
GC253700	1-C1	PLATE		100V CLASS ENGLISH	-
GC686900	1-A2	TOP COVER			-
GC687000	1-A4	CV CHASSIS			-
GC687100	1-D4	FOOT 5-5			-
GC687200	3-D3	SPACER			-
GC687300	3-C3	P SHIELD BASE			-
GC687400	3-D1	P SHIELD COVER			-
GC687500	1-B4	SPRING			-
GC687700	1-C4	HOLE COVER			-
GC687800	1−C2	GASKET F			-
GC687900	1−D2	WATERPROOF RUBBER			-
GC688000	1−D2	FP BOARD160E			-
GC688100	1−D3	CONNETCTOR COVER			-
GC688200	1−B2	CVFP CHASSIS			-
GC688300	1−C3	SW SPRING			-
GC688400	1−B3	SW COLLAR			-
GC688500	1−C3	MAIN SW			-
GC688600	4-A1	REAR PANEL160S		SYMBOL	-
GC688900	4-A1	REAR PANEL160E		ENGLISH	-
GC689000	2-A2	SECOND BOARD160			-
GC689100	3-A2	FAN BK			-
GC689200	3-A2	SW BOARD			-

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PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
GC689300	3-A2	SW BOARD COLLAR			-
GC689400	3-A2	SW WASHER			-
GC705500	3-C3	P GASKET			-
GC705600	3-D1	CORE BK			-
GC710400	2-B1	CV SPACER1			-
GC711000	1-B2	EL CORD HOLDER			-
GH462900	3-D1	MYLAR SHEET			-
GJ744600	3-B2	UPCV16APN1	Patient Board	NTSC	-
GJ744700	3-B2	UPCV16APP1	Patient Board	PAL	-
GJ744800	2-A2	UPCV16DPN1	Video Board	NTSC	-
GJ744900	2-A2	UPCV16DPP1	Video Board	PAL	-
GJ745000	2-D1	UPCV16CPN1	CPU Board	NTSC	-
GJ745100	2-D1	UPCV16CPP1	CPU Board	PAL	-
GJ750800	4-B2	UPCV16PNRP	Rear Panel Board		-
GJ750900	4-D1	UPCV16PNDF	DF Borad		-
GJ756900	1−C2	UPCL16ZZ	SW LED Board		-
GJ757800	1-D2	F PANEL1603EU		ENGLISH	-
GJ758100	1-B4	CONNECTOR BROCK U			-
GJ758300	4-A1	LIGHT CABLE	Light Cable		-
GJ758600	3-B2	FAN U	FAN U		-
GJ758700	1-B4	CAPACITOR 1603EU	Patient - Chassis		-
GJ758800	3-B1	CABLE	Video - Patient		-
GJ760800	1−C2	CABLE	Panel Sheet - SW LED Board		-
GJ767600	1-D2	F PANEL1606SU		SYMBOL	-
GJ780500	1-A4	KEY BOARD 160U			-
GJ780900	-	E KEY TOP GU		GERMAN	-
GJ781000	-	E KEY TOP FU		FRENCH	-
GJ801800	-	E KEY SEAL GU		GERMAN	-
GJ801900	-	E KEY SEAL FU		FRENCH	-
GJ840800	1-D1	CAP HOLDER			-
6N6SZ	4-D1	NUT		WE501049	-
ABSB3x8SZ	3-B2	SCREW		WE403011	-
C6N3SZ	3-A2	NUT		WE178001	-
CBK2.5x8SA	4-B2	SCREW		WE128047	-
CBK2x4SA	4-A2	SCREW		WE128014	-
CBK3x6SA	1-B4	SCREW		WE128012	-
CCUK3x4SZ	2-A2	SCREW		WE139018	-
CCUK3x6SZ	1-D4	SCREW		WE139002	-
CCUK4x10SZ	1-C3	SCREW		WE139015	-
CUKS3x6SZ	1-B3	SCREW		WE168011	-
CUKS3x8SA	1-B2	SCREW		WE168004	-
CUKSK3x6SA	4-C1	SCREW		WE168011	-
HCBK3x6SA	1-A2	SCREW		WE129002	-
HWB6SA	4-D1	SCREW		WE306016	-
T2CCUK3x8SZ	1-B3	SCREW		WE155001	-
T2CUKSK3x10SA	4-C1	SCREW		WE142013	-

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